

PATENT SPECIFICATION

989,065

DRAWINGS ATTACHED.

989,065



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COMPLETE SPECIFICATION.

Improvements in or relating to Pulleys.

We, SOCIETE INDUSTRIELLE DE TRANSMISSIONS, a French Body Corporate, of 4 rue de Presbourg, Paris 16e, Seine, France, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to variable diameter pulleys for Vee belts and has for an object a pulley which comprises a declutching device which may be operated whatever the value of the transmission ratio.

It is known that the declutching of such transmissions is most often carried out by the lateral displacement of one of the cheeks of the pulley, thus causing the belt to drop into the groove until it comes to rest on a central free wheel which is constituted by a loose pulley located at the bottom of the groove of the grooved pulley. In this position the belt is no longer driven by its lateral surfaces. This system has the peculiarity that declutching invariably changes the adjustment of the transmission ratio, since this ratio is a function of the position of the movable cheek said position being altered for declutching. After each declutching operation, therefore, the transmission ratio must be readjusted by adjusting the position of the movable cheek of the pulley in relation to the fixed cheek. There are uses in which these conditions can be inconvenient.

In order to avoid this drawback, two different control devices have been designed and are known for the movable cheek of the pulley. One of these control devices has the single purpose of adjusting the lateral position of the movable cheek in relation to the fixed cheek and therefore of determining the winding diameter of the belt and hence the transmission ratio. The other control device has the object of ensuring the declutch-

ing and clutching operations by the lateral displacement of the movable cheek. This design leads to a fairly complex system of control since each control acts upon the same movable cheek. At the moment of clutching it is not always very certain that the movable cheek will return to its original position before declutching with sufficient precision and that therefore the same transmission ratio will be obtained.

The present invention has for an object a variable diameter pulley which can be declutched for any transmission ratio and which is not thrown out of adjustment by successive declutching and clutching operations.

The pulley according to the invention has two movable cheeks around a central free wheel, the two cheeks being movable independently of each other, the movement of the one ensuring the variation of the transmission ratio and the movement of the other ensuring the declutching or clutching action.

In order that the invention may be more clearly understood, reference will now be made to the accompanying drawings showing one specific embodiment thereof by way of non-limiting example, and in which:—

Figure 1 shows an axial section through a pulley according to the invention, and Figures 2 to 7 show detailed diagrams showing the declutching action for different transmission ratios.

Referring to the drawings, the pulley comprises (Figure 1), two cheeks 1 and 2 around a free wheel 3 mounted on the shaft 4. This free wheel has an externally smooth felloe allowing the Vee belt to be wound around it during the declutching operations.

The cheeks are integral with sleeves 5 and 6 sliding on the shaft 4 but integral in rotation with the latter by means of keys. Two sleeves 7 and 8 are connected to the sleeves

5 and 6 so as to follow their axial movements but are held against rotation by the keys 9 and 10 integral with a structure 11. The sleeves 7 and 8 have threads co-operating with the threads of two other sleeves 12 and 13, the rotation of which is controlled by the hand-wheels 14 and 15.

It may be seen that, by operating upon the hand wheels 14 and 15, the cheeks 1 and 2 may be displaced. The result is that the Vee belt 16 is located at corresponding heights between the two cheeks 17 and 18 formed on the circumferential portion of the two cheeks 1 and 2.

In practice one of the hand-wheels, the left hand one, for example, is used to vary the speed and the other, on the right, for declutching. The mechanisms are similar and are symmetrically arranged. They differ only in the pitch of the nut and bolt assemblies of the sleeves 7—12 on the one hand (clutching) and 8—3 on the other hand (speed variation). This pitch is fairly fine for the latter side, to regulate the adjustment of the winding diameter of the Vee belt, and it is very much coarser for the clutch operating side.

The clutching operation has only two end positions, clutched or declutched, corresponding to the maximum displacement of the cheek 1 in one or other direction.

The travel of the cheek 1 is sufficient so that, upon displacing it, the declutching operation is carried out whatever the position of the cheek 2, whilst the displacement of this latter cheek will not allow declutching when the cheek 1 is in the clutched position. As a result, when the cheek 1 is taken away towards the right, the belt always falls to the bottom of the groove of the pulley and its inner circumference rests upon the outer felloe of the free wheel 3.

Figures 2 and 3 show the cheeks and the belt in the respective high-speed, clutched and declutched positions; Figures 4 and 5 for medium speed, and Figures 6 and 7 for low speed.

The transmission ratio is selected by fixing the left hand cheek in the appropriate position, the right hand cheek being fixed in the clutched position.

Declutching is carried out without touching the left hand cheek and clutching may be carried out and the same transmission ratio may once more be found without having to carry out readjustment.

Clutching and declutching are rapid for all transmission ratio values. In the declutched position, with the pulley revolving

or not revolving, it is possible to cause the adjustment of the winding diameter of the Vee belt to vary. It is possible, after declutching, for example to adjust the winding diameter to the value which allows reclutching to be carried out at the minimum operated speed of the belt.

When the pulley is still, it is possible to put it into the declutched position whatever the adjustment of the operative diameter, and afterwards, if necessary, differently to adjust the winding diameter at the halt.

#### WHAT WE CLAIM IS:—

1. A variable diameter and independently declutchable pulley for a Vee belt, comprising two cheeks each surrounding a central free wheel, and each cheek forming, over its circumference, one of the cheeks of the pulley, the two cheeks being movable independently of each other, the movement of the one adjusting the transmission ratio whilst the movement of the other effects the declutching operation.

2. A pulley as claimed in claim 1, in which the movement of the "clutching" cheek has a sufficiently long travel to ensure declutching whatever the transmission ratio.

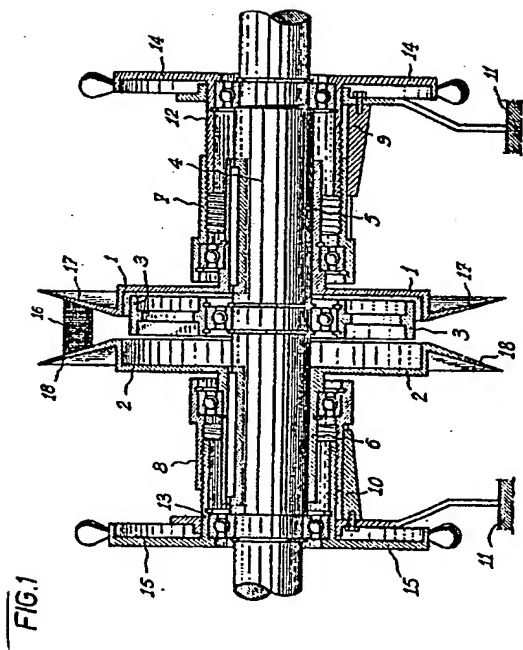
3. A pulley as claimed in claim 1, in which the movement of the "speed varying" cheek has a travel which allows the Vee belt to pass from the greatest winding diameter to the smallest without causing any declutching, the other cheek being fixed in the clutched position.

4. A pulley as claimed in claim 1, 2 or 3, in which the control of the "clutching" cheek is faster than that of the "speed varying" cheek and has only two end positions.

5. A pulley as claimed in claim 1, 2, 3 or 4, in which each control device for the movable cheeks comprises a threaded sleeve which is rotatable but fixed axially in its movement and is concentric with the shaft carrying the pulley, this sleeve being integral with an operating member such as a hand-wheel and being screwed into a sleeve which is fixed axially with one of the cheeks of the pulley.

6. A variable diameter and independently declutchable pulley, substantially as hereinbefore described with reference to the accompanying drawings.

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**FIG.2**

**FIG.3**

**FIG.4**

**FIG.5**

**FIG.6**

**FIG.7**

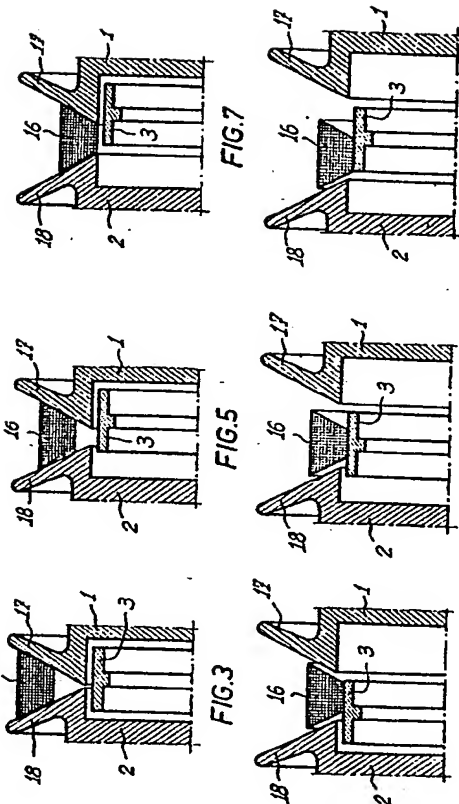


FIG.1

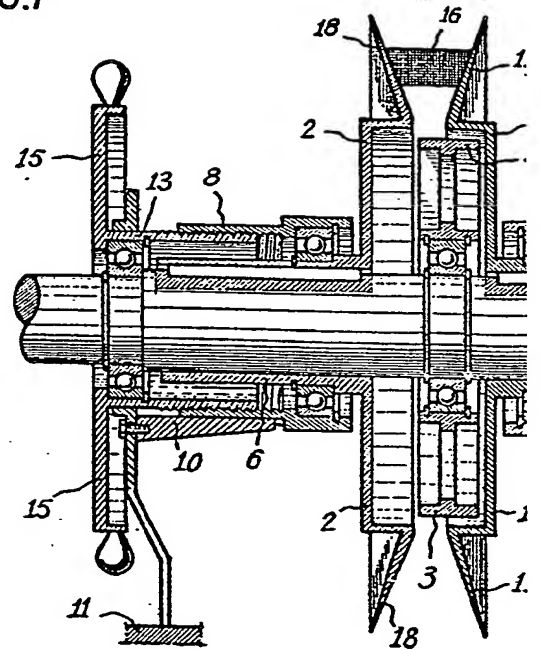


FIG.2

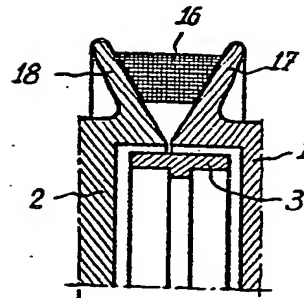


FIG.3

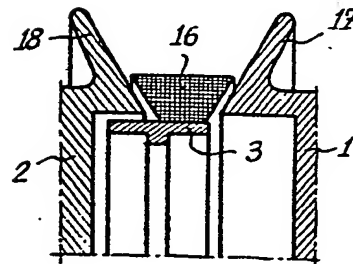


FIG.4

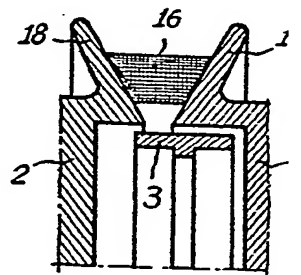
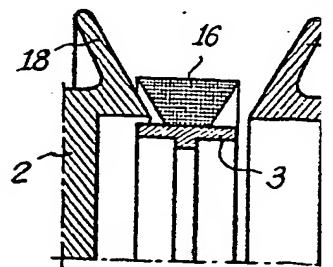


FIG.5



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COMPLETE SPECIFICATION

1 SHEET

*This drawing is a reproduction of  
the Original on a reduced scale*

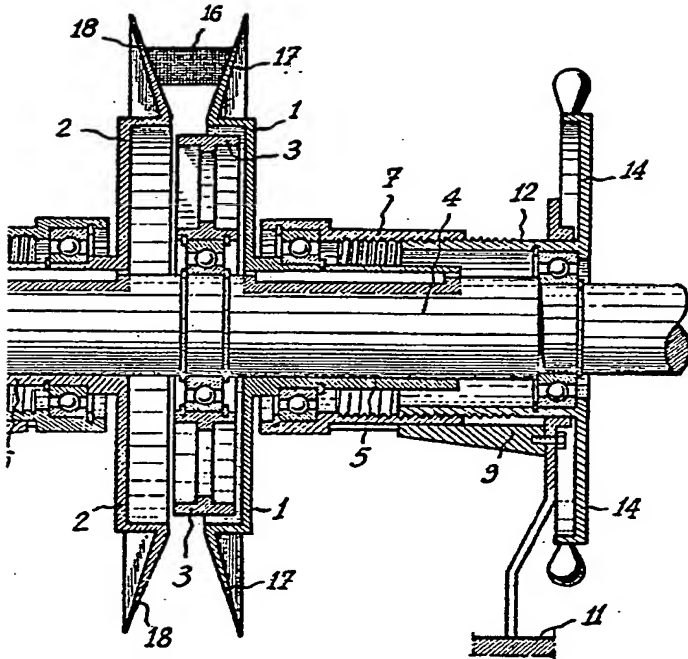


FIG. 4

FIG. 6

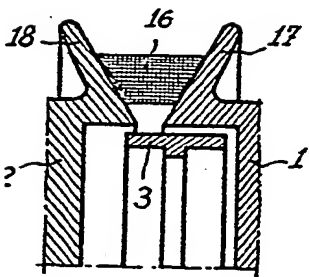


FIG. 5

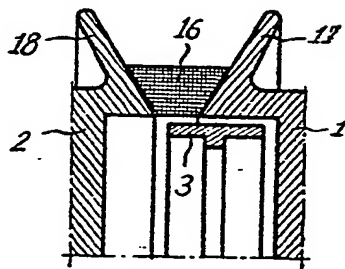


FIG. 7

